WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: ME2261

Title: A Seed Grant for Determining the Risk of Exposure to Dioxin and PCBs in Natural Water

Focus Categories: Non Point Pollution, Hydrogeochemistry

Keywords: benefit cost analysis, health effects, industrial waste water, law, model studies, pollutants, risk analysis, solute transport, toxic substances, water quality standards

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Federal Funds: $2,000

Non-Federal Matching Funds: $20,344

Congressional District: Second

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Abstract

Polychlorinated dibenzo-p-dioxins (PCDD) and dibenzo-p-furans (PCDF) are ubiquitous in the global environment and are introduced from a variety of natural and anthropogenic sources and processes. Because of their well-documented carcinogenic and reproductively toxic characteristics, PCDD/F emissions and bioaccumulation are the subject of intense public health debate and research. Maine has one of the most intensive toxic screening programs underway in the country for metals, PCBs dioxins/furans, and pesticides in lakes, rivers and streams. The Surface Water Ambient Toxics (SWAT) program is intended to assist environmental managers and policy makers resolve problems regarding toxic contamination based on statewide analysis of the distribution of toxic contamination in surface waters.

The various Kraft mills in Maine are required by law (Title 38 Section 420,2,I,3) to meet the "upstream-downstream" standard, where levels of dioxin in Maine rivers below a Kraft mill must not exceed levels above that mill. Finding an accurate way to routinely monitor dioxin levels will help to implement this plan.

The general experimental design will be as follows: field studies will be carried out in collaboration with Maine DEP. In part I, immunoassays will be taken of the Penobscot River in locations that correspond to current sites investigated by alternative means such as fish sampling and SPMDs. Data from the immunoassays will be compared to these other sources in order to verify the results obtained from the

immunoassay kits. In part II, we will again use immunoassay kits along sites of the Androscoggin River that correspond to sites currently being monitored by fish sampling and SPMDs. The results of this project will determine the effectiveness of immunoassay kits under a range of environmental conditions to determine whether and when these kits are suitable as indicators of dioxin exposure.